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# APPLICATION FOR

Technical Studies Grant

to develop part of a

Central Area Distribution System

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## APPLICATION FOR

Technical Studies Grant

to develop part of a
Central Area Distribution System

Boston Redevelopment Authority

Boston, Massachusetts

January, 1969

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# TABLE OF CONTENTS

TRANSMITTAL LETTER

GENERAL INFORMATION

Code No. 101 - Application

GENERAL PLANNING INFORMATION

Code No. 111 - Comprehensive Planning Activities
Code No. 112 - Relationship to the General Plan
Code No. 113 - Relationship to the Central Business District Plan

TRANSPORTATION PLANNING DATA

Code No. 121 - Problem Statement
Code No. 122 - Goal and Objectives
Code No. 123 - Geographic Areas of Concern
Code No. 124 - Present Transportation System
Code No. 125 - System Deficiencies

PROJECT DESCRIPTION

Code No. 131 - Scope of Project
Code No. 132 - Administration
Code No. 133 - Reports

FINANCIAL DATA

Code No. 141 - Project Budget
Code No. 142 - Narrative Statement of Budget Estimates
Code No. 143 - Source of Local Funds

LABOR STANDARDS DATA

Code No. 151 - Labor Standards Data

LEGAL DATA

Code No. 161 - Resolution of the Boston Redevelopment Authority
Code No. 162 - Certificate of Vote
Code No. 163 - Opinion and Certificate of Counsel

# CENTRAL AREA DISTRIBUTION SYSTEM

## Appendix A: Maps and Figures

1. The C.A.D.S. Area (Aerial Photo)
2. Metropolitan Transit and Highway System
3. Transit System Volumes - lost Dec 2000
4. MBTA System (core)
5. MBTA Station Volumes (core)
6. Existing and Proposed Garages
7. High Activity Destinations
8. CBD Distribution Patterns - Park Street
9. CBD Distribution Patterns - Washington-South Station-North Station
10. CBD Distribution Patterns - Other Central Area Stations
11. Pedestrian - Vehicular Conflicts
12. Unserved Areas
13. Unserved People
14. Study Areas
15. Proposed System
16. Immediate Action Route
17. Perspective of Immediate Action Route
18. Section of Immediate Action Route - missing Dec 2000
19. CBD Illustrative Site Plan Showing Mini-Projects - missing Dec 2000

These are in a separate envelope.

APPLICATION FOR
TECHNICAL STUDIES GRANT

SUBMISSION DATE

CITY OF BOSTON, MASSACHUSETTS

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APPLICATION

CODE NO. - 101

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Legal Name of Applicant

City of Boston, Massachusetts
Boston Redevelopment Authority
City Hall Annex
Boston, Mass. 02108
617/227-4270

Person to Whom Inquiries about Application should be Directed

Mr. Rick Kuner
Boston Redevelopment Authority
City Hall Annex
Boston, Mass. 02108
617/227-4270

| Estimated Budget | Technical Studies Grant |
|---|---|
| Capital Costs | N.A. |
| Operating and Maintenance Costs | N.A. |
| Study and Evaluation Costs | $375,000 |
| TOTAL | $375,000 |
| Federal Grant Requested | $250,000 |
| Local Share - 1/3 | 125,000 |

APPLICATION FOR
TECHNICAL STUDIES GRANT

SUBMISSION DATE

CITY OF BOSTON, MASSACHUSETTS

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COMPREHENSIVE PLANNING ACTIVITIES

CODE NO. - 111

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Boston Redevelopment Authority

Under Chapter 652 of the Acts of 1960, the Boston Redevelopment Authority (BRA) as the Planning Board for the City of Boston, has the power to prepare studies and plans for improving the distribution system for the City. Also, in connection with its preparation of community renewal programs, general neighborhood renewal plans, and urban renewal plans under Chapter 121 of the Massachusetts General Laws and the Federal 1949 Housing Act, as amended, the BRA has the power to make various kinds of studies including distribution studies in connection with the preparation of such programs and plans.

In addition it is open to the City of Boston, under Section 26EE of Chapter 121 of the General Laws, to contract with the BRA for the latter to carry out certain duties and powers of the City of Boston.

Massachusetts Bay Transportation Authority

Attention must be given to coordinating BRA's study with studies being undertaken by the MBTA.

Under Section 4g of Chapter 563 of the Acts of 1964, the Massachusetts Bay Transportation Authority (MBTA) has the power, to prepare a program for mass transportation within the area comprising the cities and towns set forth in the statute. Such a program must be based upon the transportation plans and programs adopted by the Public Works Commission pursuant to Section 5A of Chapter 16 of the General Laws and must be prepared in conjunction with the Department of Commerce and Development, the Metropol-

itan Area Planning Council and such other agencies of the Commonwealth or Federal government as may be concerned with such program.

Such program must be approved by the advisory board to the MBTA, and if any governmental agency decides that the program is not based upon the transportation plans and programs adopted by the Commission, the program is also subject to the approval of the Governor.

The above power in the MBTA to prepare such a program is not an exclusive one. Further, the MBTA in preparing a mass transportation system for a geographic area made up by many cities and towns may not give adequate attention to a central distribution system geared to a small portion of the center of such a mass transportation system and may not consider changes in the service used for transportation, i.e., moving sidewalks.

## RELATIONSHIP TO THE GENERAL PLAN · CODE NO. - 112

The 1965-1975 General Plan for the City of Boston and the Regional Core is a statement of the policies and programs that are intended to guide development until 1975. The Boston Redevelopment Authority, at its meeting of March 11, 1965, adopted the text and maps as the official master plan of the City of Boston.

The Regional Core includes five areas--Downtown, Downtown North, Back Bay, South End, and Parker Hill-Fenway. General Neighborhood Renewal plans for all of these areas except the South End have been completed and accepted by the Department of Housing and Urban Development. A federally approved urban renewal plan is now being implemented in the South End.

The Regional Core is functionally the heart of Boston--the "City of Ideas." It includes six major types of activities: (1) offices, (2) retail, (3) entertainment, assembly, and transient accomodations, (4) cultural activities, open space, and institutions, (5) housing, and (6) industry.

The General Plan proposes a three-point strategy for major physical development of the Regional Core.

"First, predominantly circulation improvements along the spine of the Core should ease traffic congestion and facilitate communication between the Core's separate sub- centers, which should then be enabled to expand and modernize functionally as necessary.

Second, along the fringe of the Core, close to the Inner Belt, sites for a variety of enterprises requiring proximity to the Core can be made available.

Third, inside the Core, existing residential neighborhoods should be preserved through the harmonious scaling and design of new projects, the provision of expansion room at their perimeters, and the elimination of through traffic and other circulation improvements". (page facing p. 121)

The proposals in this application are consistent with the framework established by the General Plan.

## RELATIONSHIP TO THE CENTRAL BUSINESS DISTRICT PLAN CODE NO. - 113

The plan for the 246 acre Central Business District was adopted by the Boston Redevelopment Authority on August 2, 1967 and by City Council on December 11, 1967. The plan is being implemented by means of a series of "mini-projects." The School-Franklin Renewal Project (A) and the Boylston-Essex Renewal Project (B) were approved by the BRA on May 23, 1968 and by City Council on October 7, 1968. The South Station Renewal Project (C) was approved by the BRA on October 31, 1968 and is now pending before City Council.

Approximately 600 feet of the proposed moving sidewalk are within the South Station Project Area, excluding the development proposed by the Mass. Port Authority.

The Summer Street Renewal Project (D) is in the early planning stage although it is a part of the over-all plan for the Central Business District. This project will include the remaining 800 feet of the proposed moving sidewalk.

PROBLEM STATEMENT CODE NO. - 121

The Central Area of Boston has the greatest concentration of transportation facilities in the metropolitan area, but there are still portions of the Central Area which are unserved or poorly served, particularly by mass transit facilities. Walking distances from many transit stations in the core area to areas of intensive use are unreasonably long and inconvenient.

About half of the average weekday trips to the Central Area are made by automobile. Many motorists seek destinations in the Central Area on a system of streets which are inadequate to handle large volumes of automobile traffic. Destinations of these motorists are the parking lots and garages which are distributed throughout the core area. These motorists create street congestion and contribute to an unsafe and unpleasant pedestrian environment.

The purpose of a Central Area Distribution System would be to provide a supplementary means of transportation to distribute people to and from public and private transportation terminals and to circulate people within the Central Area. The system should solve specific distribution problems and should help achieve planning and design objectives for the Central Area.

The distribution problems of the Central Area are associated with the pedestrian, the existing transit system, and the automobile and street system. Primary pedestrian problems which a Central Area Distribution System should alleviate include:

- unreasonably long walking distances from transit stations and parking garages to major destinations within the Central Area.

- confusion and lack of clarity of existing pedestrian routes within the retail core and financial district.

- overcrowded sidewalks in high intensity use areas which at times force pedestrians to walk among cars in the streets.

- heavy volumes of traffic which form barriers to pedestrian movement.

- unattractive and unpleasant physical environment for the pedestrian in many portions of the Central Area.

Transit problems within the Central Area which should also be alleviated by a supplementary distribution system include the following:

- poor service to some portions of the Central Area from existing transit lines and stations.

- unpleasant crowding of some stations in the Central Area.

- the necessity of making two or more transfers to reach some portions of the Central Area.

- long waiting time, particularly in off-peak periods and circuitous access between underground facilities which is too time consuming and out of scale for short intra-core trips.

For half of the people who now enter the Central Area by automobile, there are also problems which should be alleviated by a supplementary distribution system:

- the overtaxed capacity of the street system due to the number of automobiles seeking centralized parking destinations.

- excessive travel time from some parking facilities to ultimate destinations.

GOALS AND OBJECTIVES CODE NO. - 122

GOAL

To provide an attractive, efficient and convenient transportation alternate to the use of the private motor vehicle or walking trips within the Central Area.

OBJECTIVES

- to increase the accessibility of more destinations from more origins within the Central Area.
- to integrate new distribution systems with the existing transit and automobile systems.
- to reduce the number of motor vehicles circulating within the Central Area.
- to maintain and improve the pedestrian character of the Central Area.
- to improve the clarity of movement within the Central Area.
- to decrease the need for additional parking facilities in the core area over a long term period.

GEOGRAPHICAL AREAS OF CONCERN CODE NO. - 123

The area of concern is the Central Area of Boston. In defining its limits, the following criteria were applied:

1. The Central Area is a very specialized environment, offering many services that are not economically feasible elsewhere, and dependent upon good access to a sufficiently large population to support these unique services.

2. The Central Area is the one area of the city most accessible to different kinds of people, integrated economically and ethnically. This is a unique aspect which represents a very significant part of the total environment of society.

3. Access to the Central Area from any particular other area is the key through which people using that area can also enjoy the use of the Central Area. Conversely, the nature of access to the Central Area is a factor which in the long run affects the desirability and existence of development in a particular area.

4. The Central Area is the area which produces a high level of tax return through its high intensity of use, which return is basic to maintaining the quality of the environment in the rest of the city.

DEFINITION: CENTRAL AREA

The Central Area is that part of the City of Boston lying within the proposed Inner Belt Expressway, including primarily the Boston peninsula, plus the major medical center area in the Fenway. The boundaries of the area are shown in Figure 1.

Functionally, the Central Area may be defined as that part of the City containing, or potentially containing, the bulk of regionally, rather than locally, oriented activities. It includes the Central Business District, with its retail core, government, financial and business and professional services as well as several varied residential neighborhoods such as Beacon Hill, North End, Chinatown, Bay Village, Back Bay, South End and the Fenway. In addition, major medical, educational and cultural institutions of the Boston region are located here. Also, the Central Area is the focus of the region's rapid transit and highway systems.

## DEFINITION: SPECIFIC SUB-AREAS

In the Central Area Distribution System study (May, 1968) five specific sub-areas of the Central Area were identified as areas to be closely examined in relation to the relative adequacy of existing transportation facilities. Two of the sub-areas are strongly influenced by the regional importance of the Central Business District.

1. South Station-Retail Core
2. South Station-North Station
3. South Station-Back Bay
4. Massachusetts Avenue
5. Hospital-Fenway

The defined Area of Concern, the several sub-areas discussed herein and a generalized notion of a total route system are shown in Figure 13 and 14. This application deals with the first sub-area - South Station - Retail Core. Future Technical Study Grant or Demonstration Project Grant applications will deal with the other sub-areas.

### South Station - Retail Core

This sub-area includes a major transportation terminal at South Station. It includes a planned 5,000 car parking garage, railroad station, inter-city and commuter bus terminal and a rapid transit station serving the new South Shore line as well as the Dorchester transit line. The sub-area already has the greatest concentration of retail activity in the Boston Region which will be added to by new activity at South Station and along Summer Street as part of the CBD renewal Project. It needs a pedestrian oriented link between the transportation terminal and the retail core.

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PRESENT TRANSPORTATION SYSTEM

CODE NO. - 124

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The present transportation system serving the entire Boston area as well as the Central Area is a transit-highway-garage system in various stages of development. Its major elements are shown in Figure 2. It is a system which over the years has grown as the area has grown. In many ways it is more expressive of past needs and levels of expected service than present or future. Plans for its improvement are being actively pursued, but these improvements primarily have the form of rapid transit extensions into the suburbs and construction of radial freeways connected to an Inner Belt freeway. There are various advantages and disadvantages to those programmed improvements but, rather than address those, this application concentrates on the neglected sector -- Central Area distribution.

## The Transit System - Existing and Programmed

The transit network of the Boston region is strongly focused in a radial pattern from the outlying areas into the Central Area. It is operated by a regional public agency, the Massachusetts Bay Transportation Authority. Its backbone is three high platform rapid transit lines and one low platform trolley system, all of which operate in subway through most of the Central Area. A detailed description of the system is as follows:

### High Platform - Rapid Transit

A. BLUE LINE running from BOWDOIN to WONDERLAND
B. ORANGE LINE running from FOREST HILLS to EVERETT
C. RED LINE running from HARVARD to ASHMONT

## Subway - Surface Trolley Lines (GREEN LINE)

The GREEN LINE subway-surface lines are six in number and consist of trolley lines which operate in part in the street, in median reservations and on private right-of-way outside the Central Area and in subway in the Central Area.

A. WATERTOWN LINE: subway to KENMORE SQUARE, center of road median to Commonwealth and Brighton and street running to WATERTOWN.

B. BOSTON COLLEGE LINE: subway to KENMORE SQUARE and center of road median in Commonwealth Avenue to BOSTON COLLEGE.

C. CLEVELAND CIRCLE LINE: subway to KENMORE SQUARE and center of road median in Beacon Street to CLEVELAND CIRCLE.

D. RIVERSIDE LINE: elevated from LECHMERE to the CENTRAL AREA, subway to KENMORE SQUARE and grade separated right-of-way to RIVERSIDE.

E. ARBORWAY LINE: subway to NORTHEASTERN UNIVERSITY, center of road median in Huntington Avenue to FRANCIS STREET and street running to ARBORWAY.

F. HIGH-SPEED LINE: private right-of-way with two grade crossings from MATTAPAN to ASHMONT.

A schematic picture of the basic transit system is shown in Figure 3. It also depicts the number of persons which enter each station in an average day. Of significance is the overshadowing importance of Park and Washington Stations compared with the others. Also it is of interest to note the large numbers boarding at most of the outlying terminal points, an indication of the strength of transit demand beyond the ends of the present rapid transit service.

## Surface Bus Network

The surface network is operated with diesel buses and three trolley bus lines. Most routes begin at a rapid transit station and radiate to the suburbs or to another station; of the few that do not follow this pattern, most pass through a rapid transit station on their route.

Recent acquisition of the entire Eastern Massachusetts Street Railway Company, which was the largest private operation in the area, has added another extensive bus system not yet integrated with the total system.

With virtually all bus routes feeding the transit stations outside the Central Area rather than penetrating directly, Boston has the lowest complement of buses travelling its Central Area streets of any city of substantial size. This system, whether deliberately planned or merely inherited, is expressive of the inability of Boston's central streets to adequately carry automotive travel. The net result is that the major transit arrival points, the stations, are few in number and easily identified. The location of these stations in the Central Area is shown in Figure 4 and the volume of users is shown in Figure 5.

## Programmed Improvements

In recognition of the need for improved and extended transit service a vigorous program was adopted by the MBTA in its Master Plan of August 1966. The elements of this plan are described below:

1. Extension of the Forest Hills-Everett Orange Line in two directions together with replacement of the entire elevated portion of the line: 6.1 miles from downtown to the Malden-Melrose town line and 8.4 miles from downtown to the VFW Parkway in West Roxbury.

2. Extension of the Cambridge-Dorchester Red Line in two directions: 2.5 miles northwest to Alewife Brook Parkway in Cambridge and 13.7 miles from downtown to South Weymouth.

3. Replacement of the rolling stock on the Riverside-Lechmere route of the Green Line and extension of the line one mile into Somerville.

4. Replacement of the older rolling stock on the East Boston Blue Line and air conditioning of existing Cambridge-Dorchester Red Line and Forest Hills-Everett Orange Line cars.

5. Expansion of the station modernization program already underway.

6. Continuation of the bus replacement program already underway and construction of two garages to replace obsolete facilities.

7. Other selected improvements to the existing plant to improve operating efficiency and economy.

## The Highway System - Existing and Programmed

The highway system of the Boston region is designed to focus traffic on the Central Area. It consists of six existing or planned radial freeways, (one of which is toll operated). These radials penetrate from all quadrants except the east. They intercept an outer belt (I-495) at approximately 30 miles radius from the center, a circumferential (Rte. 128) at about 10 miles, and an inner belt (I-695) with a scant two mile radius. Functionally, all these major routes terminate at the inner belt except the toll facility which crosses one side to the other on a chord very close to the diameter.

The inner belt is offset slightly northward and westward of the center of major activity, with the result that the southern and eastern segments pass along the edge or through the Central Area itself. These segments are very close to major destination points, and therefore the interchanges serve as the primary highway arrival points in the Central Area.

The freeway system is superimposed on an extensive parkway system which has been developed by the Metropolitan District Commission. Many parts of this system have partially limited access, and it too tends to focus radially on the Central Area. In like manner the inherited arterial street system of Boston focuses on the Central Area.

The focal nature of this system of freeways, parkways and arterials, augumented by the limited number of crossing points of the Charles River and the harbor, sets a pattern of a very limited number of easily indentifiable major highway arrival points. Unfortunately, the street system within the inner belt is entirely inadequate for any large volumes of automotive travel. Indeed many streets are barely adequate for the pedestrians that also use them and the existing narrow sidewalks cannot be widened without further decreasing roadway widths. Under these circumstances, the system only works to the extent that traffic can be handled near the arrival points without undue penetration of the inner area.

Major segments of the system described above have not yet been completed. Most importantly, I-93 from the north and I-95 from the south have not yet reached the inner belt and the western half of the inner belt itself (I-695) is not constructed. Nevertheless, the pattern is clear and predictable. The new routes will only emphasize it.

Recorded volumes of traffic crossing a cordon line bounded by Massachusetts Avenue, Charles River, the Harbor and Fort Point Channel are shown below. This cordon closely follows the Central Area boundary and is indicative of the amount of travel the Central Area streets must carry. Historically, major increases in this traffic flow have only occured when new facilities such as Storrow Drive and the Central Artery (eastern leg of Inner Belt) were constructed. This is evidence that the basic street pattern is, and for sometime has been, operating at capacity.

Number of Vehicles Crossing Cordon Line During Peak Periods and between 7:00 A.M. to 12 Midnight in 1938, 1954 and 1964.

| | 1938 | 1954 | 1964 |
|---|---|---|---|
| 7:30 - 9:00 A.M. | 46,093 | 57,766 | 83,592 |
| 4:30 - 6:00 P.M. | 54,264 | 68,894 | 89,088 |
| 7:00 A.M. - 12 Midnight | 433,048 | 518,430 | 696,732 |

## Present and Proposed Off-Street Parking System

The garage system is an adjunct to the automotive arrival system and its performance can be gauged best by the proximity of this system to the highway arrival points. In the Central Area there are 330 lots providing 17,520 parking spaces and 43 garages providing 15,518 spaces. These facilities are interspersed all over the area and many of them create traffic problems due to poor accessibility and poor internal circulation. Figure 6 shows the location of existing garages with a capacity of 200 or more parking spaces, and the current proposals for major new garages. Only a slight resemblance of a parking system tied into the arrival system can be read into the existing pattern. New policies are required to properly organize this pattern.

The nature of available parking spaces is shown below:

### Parking Spaces Within Central Area

| Off-Street Spaces for Public Use | Number of Units | Total Capacity | |
|---|---|---|---|
| Publicly Owned Lots | 11 | 1,144 | |
| Privately Owned Lots | 151 | 9,797 | |
| Publicly Owned Garages | 9 | 6,869 | |
| Privately Owned Garages | 23 | 7,194 | |
| Total Public Off-Street -- | 194 | | 25,004 |
| **Curb Spaces for Public Use** | | | |
| Metered Spaces | | 4,258 | |
| Legal Unmetered Spaces | | 10,464 | |
| Total Curb Spaces -- | | | 14,722 |
| **Total Parking Spaces for Public Use:** | | | |
| **Spaces for Private Use** | | | |
| Publicly Owned Lots | 30 | 1,763 | |
| Privately Owned Lots | 138 | 4,816 | |
| Privately Owned Garages | 11 | 1,555 | |
| TOTAL SPACES FOR PRIVATE USE - | 179 | | 8,134 |
| TOTAL PARKING SPACES WITHIN BOSTON PROPER - | | | 47,860 |

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SYSTEM DEFICIENCIES

CODE NO. - 125

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The basic requirement of a total transportation system is to deliver people to their final destination. This is not necessarily possible through sole use of the major delivery systems supplemented only by walking. To achieve an understanding of the areas which require service to points of final destination, the Central Area activities chart shown in Figure 7 has been prepared. It shows concentrations of activity without reference to how persons arrive at those concentration points. This section investigates the relative adequacy of service to those activity areas.

Transit Service

Transit station volumes show extremely high load concentrations at the two major stations serving the retail core. The Washington Street station services 47,600 entering passengers each day, while the Park Street station volume is 34,200. By contrast the Arlington Street station, next largest, accomodates only 18,000 people. It is emphasized that these figures represent the number of passengers who enter each station and thus are not the best measure of station importance. The volume of passenger transfer from one line to another, coupled with these external station volume, is a more comprehensive indicator of station activity. Data analyzed in the Eastern Massachusetts Regional Planning Project (EMRPP) transit survey disclosed large amounts of line transfer at the Park, Washington, and State Street stations. When transfer volumes are added to external trips, the following comparisons result:

| STATION | EXTERNAL VOLUME | TOTAL MOVEMENTS |
|---|---|---|
| Park Street | 34,200 | 75,300 |
| Washington Street | 47,600 | 56,300 |
| State Street | 15,800 | 28,800 |

Since the external volumes are 1966 data and the total movement reflects 1963 conditions, the data are not directly comparable, but are useful in determining the magnitude and location of transfer points. Considerable pressure is exerted on the operation of all the street car and subway lines due to the heavy loading and transfers at these three locations, particularly the Washington and Park Street stations. The proposed supplementary distribution system should have relief of this concentration as one of its goals which could be done by intercepting transit riders at other less crowded stations.

In addition to the total concentrations of persons at a few stations, it is of interest to note the distribution of ultimate destinations of persons arriving at the Central Area stations. Figures 8, 9 and 10 show destinations of persons arriving at the transit stations, without reference to the method they employed to achieve their final destination (their choices, of course, were to walk or to transfer to another line which would bring them closer). If 800' is considered to be maximum desirable walking distance, it is evident, that even though each station provides direct service for a sizable number of persons, the majority are subjected to transfers or excessive walks.

The following tabulations give examples of dual transfer movements using the rail transit system. In some cases single transfers via buses will accomplish the same trip:

| | FROM | TO |
|---|---|---|
| 1. | Northbound from Forest Hills | Back Bay--Prudential |
| 2. | Westbound from East Boston | South Station area |
| 3. | Westbound from East Boston | Beacon Hill-Charles Street |
| 4. | Northbound and southbound on Harvard-Ashmont | Atlantic Avenue & East Boston |

Analysis of the EMRPP transit data confirms that all of these movements are made but the volumes of each are relatively small. The time involved in making these involved trips undoubtedly is enough of a nuisance to encourage other distribution modes (i.e. taxi, auto, walk).

The tabulation below summarizes the major transit station movements of significant length. Several observations can be made. First, the financial district appears to be a major attractor of trips. Second, major movements from Washington Station are oriented North, East and South to an area roughly bounded by North and South Station. Finally, the transfer movements from the Park Street Station are arrayed in all directions with the longest trips of any substantial volume oriented toward the west (Park Square, Copley Square).

### SUMMARY OF MAJOR MOVEMENTS FROM TRANSIT STATIONS

| | STATION | DESTINATION |
|---|---|---|
| 1. | Park Street | North Station<br>South Station<br>Government Center<br>State Street<br>Beacon Hill<br>Park Square<br>St. James Ave. - Boylston Street<br>Copley Square |
| 2. | Washington Station | South Station<br>Financial District<br>Upper Washington Street<br>North Station |
| 3. | South Station | Financial District |

## Parking Service

If the basic objective of the Central Area Distribution System to supplement the delivery or arrival system is to be satisfied, consideration must be given to the geographic distribution of the parking supply. Since the highway and transit modes feed nearly equal numbers of passengers into the Central Area, the location of existing transit stations and major parking facilities should strongly influence the layout of the new distribution system. The relative diffusion of the parking supply created by its space requirements and dependence upon sufficient access capacity,

as opposed to the relative concentration of transit arrival points, suggests that it will influence layout of the distribution system to a lesser degree.

The off-street parking supply in the Central Area has serious locational problems. A number of the major garage structures which have been built close to the retail core are faced with most difficult access problems. Situated far from any existing or proposed freeway ramps, they require more travel on the street system. In contrast, much of the supply, particularly the larger lots, is remote from demand centers, and the lack of distributary transportation service creates long walking distances.

With respect to the retail core, the avilable parking supply is peripheral in location. There are virtually no off-street parking spaces within a radius of 800' from the center (Washington, Winter, and Summer Streets) of this high density section. This is a healthy situation from the point of view of avoidance of congestion, but it points up the need for a distribution system.

## Through Traffic

The radial pattern of Boston's transit and highway system clearly encourages the use of these approach facilities by persons moving through, as well as into the Central Area. This serves to force some traffic on to surface arterials and make internal circulation a more difficult problem. This situation, occurring within the context of a capacity-limited system, is manifested in congestion in the subways, in the streets, and on the sidewalks of the Central Business District. The CBD Urban Renewal Circulation and Parking Study, for example, showed that some 20 to 30% of motor vehicles on the arterial streets of the core area are through vehicles. Since these data do not include such major facilities as the Central Artery and Storrow Drive, where through volumes are greater, it is highly significant.

Surprisingly, transit traffic, which is usually thought of entirely in terms of Central Area destinations, also includes a substantial segment of through trips. Data from the EMRPP shows that 22% (96,000) of all transit trips into the Central Area each day are through trips. Any reductions in the quantity of through traffic would automatically improve circulation in the Central Area. While the inner belt will undoubtedly remove some of the vehicular through trips from the arterial streets, the probable magnitude of the diversion is not clear. No plans now exist for bypassing transit passengers around the Central Area.

In view of the fact that through traffic cannot be substantially diverted from the basic delivery system, a well integrated distribution system could help relieve the resultant congestion.

## Pedestrian Walking Distances

Since people normally select a parking facility or a transit station which is as close as practicable to their final destination, it is revealing to examine the distance which they walk after arrival in the Central Area as an indication of the system's efficiency. The average pedestrian circulating in the Boston CBD walks 1200 feet. This is more than twice the average distance (550 feet) found in other cities and far surpasses the longest national average walking distances for most parking durations or trip purposes. A summary of these data is shown on the following page. It is immediately clear that the entire distribution of walking distances is grossly different from the norm.

The distance a person will walk obviously can be influenced by several factors, and it is well to review them. The size of the city has an influence on walking distances. Generally, the larger the urban area, the further people walk from their arrival point. Weather conditions play an obvious role in limiting desirable walking distance, and it can be safely assumed that Boston's weather is at least as severe and variable as any city of comparable size.

Presumably, the speed which one can walk, the congestion he encounters, and the overall attractiveness of the environment may influence both his choice of routes and his acceptable walking distance. Comparative walking speed data are not available, but in view of Boston's extreme sidewalk and street congestion problems and its high frequency of street crossings, it is unlikely that walking speeds are any higher than in other cities. Parking rates in Boston are high, particularly in closed in facilities, and this undoubtedly has the effect of lengthening walking distances, but cannot conceivably account for all of the large differential.

Since none of the above factors explain why Boston pedestrians walk twice as far as pedestrians in other large cities, one must conclude that the condition is a direct effect of spatial relationship between points of arrival (parking facilities, transit stations) and points of final destinations.

Comparison of Walking Distances

| DISTANCE (IN FEET) | Percentage of People Walking Less Than Distance Shown | |
|---|---|---|
| | BOSTON* | OTHER COMPARABLE CITIES** |
| 350 | 7 | 45 |
| 750 | 25 | 68 |
| 1150 | 54 | 81 |
| 1550 | 68 | 89 |
| OVER 1550 | 32 | 11 |

*Source: Traffic Circulation and Walking Plan, Boston CBD by Barton - Aschman Associates.

**Source: "Parking" by the Eno Foundation, Saugatuck, Connecticut.

Summary

In general, the basic system deficiencies may be summarized as follows:

(1) Substantial portions of the Central Area are poorly serviced by existing transit station and parking supply locations. Those areas lacking good transit access are: the financial district, the North End, the Back Bay, and the Fenway-Parker Hill medical complex. Of these, the financial district is the most significant in terms of its volume of trip destinations. Those areas relatively remote from the off-street parking supply are: the retail core, the Back Bay, Beacon Hill, and the North End. Obviously in terms of trip attraction the retail core is relatively more important.

(2) Distances walked by pedestrians are much longer in Boston than in most cities of comparable size. While this is a result of the transportation system's shortcomings rather than a specific deficiency itself, it is a vivid refection of the inadequacy of present circulation within the Central Area.

(3) There is a significantly large amount of transferring between transit lines with one, and sometimes two, transfers necessary within the rail transit system alone (i.e., not counting surface feeder transfers at the beginning of the trip), in order to satisfy certain origin-destination interchanges. As already noted, most of this line transfer occurs at the Park Street and Washington Street stations. The volume of transfers will increase in the future as Central Area development takes place outside of the Boylston-Tremont-State-Washington Street rectangle.

(4) Surface circulation within the Central Area is severly hampered by insufficient street widths (both for vehicles and pedestrians),

a generally discontinuous street system configuration, insufficient application of modern operational techniques, insufficient off-street truck loading facilities, and a low level of parking control and enforcement.

(5) Location of the major parking structures is such that most of the closer in facilities have access problems, while the exterior or peripheral areas are without supplementary transit service.

(6) All major existing transit and highway facilities traverse the Central Area promoting the use of this area for through trips.

(7) Development in and around the retail core plus the transit system configuration concentrates transit loading to a large degree at the Park and Washington Street stations. Since these are also the two major transfer stations, substantial pressures are exerted on the entire system at these points.

(8) Pictorial summarizations of the above deficiencies are set forth in Figures 12 and 13. These show the portions of the Central Area and the number of persons that may be considered as unserved, or inadequately served by the existing system. A supplementary distribution system should be aimed at curing these deficiencies.

SCOPE OF PROJECT CODE NO.-131

Perhaps the most difficult step in an evolutionary process is that of properly specifying and obtaining the next generation of equipment. The enormous costs of conceiving, planning, engineering and building complex transportation devices sets severe limitations on this activity. Even when unsatisfied needs are adequately described, it is most difficult to translate them into workable solutions. Unfortunately, obtaining an accurate description of needs themselves is often dependent on operation of some kind of equipment that at least approximates the ultimate solution. This situation requires that a search for immediate action possibilities be tied to the relative availability of potential types of equipment. Each type must be considered not only from the point of view of what it is intended to do but also in consideration of whether it can be obtained so it can do it.

Moving Belts

Conveyor belts for the movement of goods and raw materials have been commonplace for many years. The application of this relatively simple device to the movement of people is comparatively recent. The first installation of a moving sidewalk was just 16 years ago, and at the present time, no more than 200 of those units are in operation throughout the world. This is rather surprising considering the advantages inherent to this form of mass transportation. No other presently used public transportation service has the advantage of continuous service; very few have automatic operation. The walks, like escalators, can be made to be

reversible, allowing some flexibility to handle peaks. Other advantages include low operating cost, high capacity, and safety. Inquiries on this latter, very important aspect, revealed an almost unblemished record of non-injury operation of existing walks used by the public.

The prime disadvantage to moving sidewalks is their relatively low speed of travel. National codes limit them to 3 feet per second which is only 75% of normal walking speed, and most installations are operated below code allowance. This disadvantage can be offset somewhat by installing belts of sufficient width to permit walking with the belt, and passing others along the way. This is an entirely acceptable procedure for most pedestrians; it has the net effort of cutting the distance actually walked to 57% of the true distance and the time to 57% of the normal walking time. Those persons to whom time is relatively unimportant can make the trip without walking at all. In addition, it is possible to walk part of the way and rest part of the way without losing all the time of the rest period.

The speed of moving belts is controlled by the ability of persons to enter and leave at the end points and cannot be substantially changed. Some studies have been made of possible acceleration to greater speeds along the mid-portions. Eventually, the technical problems of the procedure may be solved.

All the above suggests that moving belts can be used in particular situations that likely would involve walking in any event. The relative availability and cost of other modes of travel would have a bearing on the practical usable distance. Entry and exit points by means of short belts adjoining the longer through belt at selected points would also make the service available for numerous short trips.

The capital cost of a moving sidewalk, including engineering and installation, but not structure, varies from $300 to $400 per foot of length depending on width, length and speed.

A unit occupies a depth of about four feet, measured from the bottom of the drive mechanism to the top of the belt. An upper limit on the degree of incline is 15°. (27% grade)

The oldest moving sidewlaks under public ownership are in Tacoma. They are over five years old, and the initial insurance premium was based upon experience in the escalator field. The current premium is half of the original, and no accidents have been reported.

The approximate capacity of a moving sidewalk in widths over 24" can be expressed as 2000 persons per hour per foot of width. Commonly, installations have widths of 3 to 4 feet, with corresponding capacity of 7000 persons per hour, depending on speed.

The annual power cost has been estimated to be $1.00/year per 1000 passengers per hour of capacity per foot of length.

The moving sidewalk system would be a set of moving belts laid end to end in pairs for two-way movement. The system would start at the South Station head house and would extend to the intersection of Summer and Chauncy Streets, which, in the overall CBD plan, is the beginning point of the retail core pedestrian area which is to be specially designed for the proper accommodation of the walking mode.

Pedestrian interchange areas would be provided by short interchange belts. These short belts would be located alongside and adjacent to the through belts at appropriate locations. Cross-over to and from the through belts would be provided to accomplish the interchange movement.

The overall system would be approximately 1400 feet in length with 5 intermediate access and distribution points. The needs of persons

arriving at South Station by automobile, bus, train and transit would be served as well as those travelling to and from intermediate points along Summer Street. The system would be entirely above street level and encounter no motor vehicle conflicts. It would be entirely sheltered within buildings or within its own cover where it passes over streets to negate any climatic problems. The location of the system in the upper level of the buildings is shown schematically in figure 18. Details of the system and the loading estimates are set forth below.

South-Station (Building 43 on Figure 16) to Chauncy and Summer Streets.

1. Length - 1400 feet
2. Number of access points - 5
3. Access at the following locations:

    a. New Commercial area
    b. New Office tower
    c. New Commercial area
    d. New Commercial area
    e. New retail area end to end,

4. Travel time end to end - approximately 8 minutes at 3 feet per second standing on the belt or 4½ minutes walking with the belt.

### Loading factors - Moving Sidewalk

A. The moving sidewalk would serve the following groups of potential users:

1. Pedestrians now using sidewalks along Summer Street
2. New pedestrians attracted into the area by the new South Station-Summer Street commercial land uses.
3. New transit riders from the new South Shore transit line.
4. New auto arrivals using the 5000-car garage
5. Existing transit riders diverted from the subway for a portion of their trip
6. New bus arrivals from proposed intercity and commuter bus terminal.

B. Garage will be utilized 1/3 - 2/3 by shoppers versus long-term parkers (estimated)

C. All-day parkers will be situated in controlled locations furthest from Summer Street.

D. Maximum loads on Moving sidewalks will occur during the normal afternoon 4:30 to 5:30 p.m. peak period (see following loading analysis)

### Peak Flow Components - Moving Sidewalk

| | TIME PERIOD | | | |
|---|---|---|---|---|
| TYPE OF MOVEMENT | NORMAL MORNING PEAK HOUR 7:30-8:30 A.M. | EARLY AFTERNOON PEAK HOUR 1-2 P.M. | NORMAL AFTERNOON PEAK HOUR 4:30-5:30PM | EVENING PEAK HOUR 6:30-7:30 |
| Home to Work | Yes (N.B.) | - | - | - |
| Home to Shop | - | Yes (N.B.) | - | - |
| Home to Stadium | - | Yes (N.B.) | - | Yes (S.B.) |
| Work to Shop | - | Yes(N.B.&S.B.) | - | - |
| Work to Home | - | - | Yes (S.B.) | - |
| Shop to Home | - | Yes(N.B.&S.B.) | Yes (S.B.) | - |
| Stadium to Home | - | - | Yes (N.B.) | - |

NOTE: S.B. and N.B. refer to southbound or northbound direction of flow on moving sidewalks.

Estimates of the total users of the proposed moving sidewalk system are difficult at this stage except in regard to those which will be arriving or departing the major transportation system at South Station. Those are as follows:

Estimated Peak Hour Movements (P.M.)

| Component: | Northbound | Southbound | Total |
|---|---|---|---|
| A. South Shore Riders (New) Increased Development | | 2000 | 2000 |
| B. Existing Transit Riders | 2700 | 1000 | 3700 |
| C. Existing Parking Supply | | 360 | 360 |
| D. New Parking Facility | | 1000 | 1000 |
| Totals | 2700 | 4360 | 7060 |

The above tabulation indicates some 7000 persons will use the sidewalk in the evening peak hour. These would produce an estimated peak loading of 436 in the peak direction in the peak five minutes which is well within the capacity of the sidewalk. Added to these on a daily basis would be those who travel to and from intermediate access points throughout the entire day. The volumes of the latter will be related to the kinds of development and activity near the access points.

The timetable for installation of the moving sidewalk system is tied to the development timetable for the project area. The various segments would be installed as the development itself progresses. Active development studies now underway indicate that the first installation could be placed within three years. The initial installation will be of sufficient length to constitute a real-life test.

It is proposed that a 6 month Phase I technical study of moving sidewalks be conducted starting early 1969. This study would include detailed studies relating to management, operations, capital requirements, and economic feasibility as well as the preparation of engineering and architectural surveys, plans, and specifications.

After Phase I is complete, additional work will be delayed until a Summer Street developer has been selected, plans and specifications are prepared and the moving sidewalk is installed.

Immediately after the installation of the moving sidewalk, it is proposed to conduct an 18 month test. (Phase II) The test would include observations and interviews of users to determine acceptability and usefulness of the system. Trends in the use of the system and the other systems to which it relates, such as the garage, railroad, bus and transit terminals at South Station, would also be determined. From time to time, adjustments in physical facilities of a guidance and convenience nature leading to and from the belts might be made to determine their effect. The basic objective of the test would be to determine the needs and desires of the persons served and whether this system properly met those needs. The overall time period of the test, insofar as it relates to the initial installation, would be sufficient to provide information concerning dependability, operational and maintenance factors. Upon completion of all tests, assuming it had proven worthy of continued existence, the system would be designated as a permanent feature of the development and its operation continued.

APPLICATION FOR
TECHNICAL STUDIES GRANT

SUBMISSION DATE

CITY OF BOSTON, MASSACHUSETTS

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ADMINISTRATION — CODE NO. - 132

All study and evaluation work will be conducted by the staff of the Boston Redevelopment Authority or its consultants.

The South Station terminal has already been acquired by the Boston Redevelopment Authority for urban renewal purposes and the Mass. Port Authority has been tentatively designated as the developer. The Mass. Port Authority has tentatively agreed to build a continuation of the moving sidewalk in their proposed South Station garage. A fully outlined renewal plan for South Station and the immediately adjoining Summer Street area is now in preparation. The remaining sector of the Summer Street area which is included in this action proposal has been identified as one of the most critical for renewal activity as soon as a project can be developed and approved. Furthermore, the renewal of South Station and Summer Street is an integral part of an overall Central Business District plan, thus assuring that action here is compatible with all development goals for the area.

The estimated timetable for the Technical Studies Grant is as follows:

| | Time |
|---|---|
| Phase I of Technical Study | 6 months |
| Preparation of Summer St. Development Plans | 18-24" |
| Installation of Moving Sidewalk and Construction of Summer St. Development | 18-24" |
| Phase II of Technical Study | 18" |
| | 60-72" |
| | 5-6 years |

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REPORTS

CODE NO. - 133

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Both a preliminary and a final report will be prepared. These reports will include:

1. the origins and destinations of the users
2. volumes
3. time - speed
4. public reaction and acceptance including why people refuse to use the equipment
5. desirable and undesirable characteristics of the equipment
6. relationship and compatibility with other modes, including walking
7. financial data
    a. construction costs
    b. operating costs
    c. maintenance costs
8. problems solved or not solved by the equipment
9. recommendations

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PROJECT BUDGET

CODE NO. - 141

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A narrative statement of the budget estimates is included under Code No. - 142.

Technical Studies Grant - Moving Sidewalks

A technical studies grant of $250,000 is requested for a 6 month period (Phase I) prior to the installation of the moving sidewalk and for an 18 month period after installation (Phase II). The 6 month Phase I study will include detailed studies relating to management, operations, capital requirements, economic feasibility and the preparation of engineering and architectural surveys, plans, and specifications. The 18 month Phase II test will include observations and interviews of users to determine the acceptability, cost, and usefulness of the system.

| Budget Summary | Technical Studies Grant - 24 months |
|---|---|
| 1. Capital Costs | N.A. |
| 2. Operating and Maintenance Costs | N.A. |
| 3. Study and Evaluation Costs | $375,000 |
| Total (Lines 1-3) | $375,000 |
| 4. Federal Grant - 2/3 | $250,000 |
| 5. Local Share - 1/3 | 125,000 |

APPLICATION FOR
TECHNICAL STUDIES GRANT

SUBMISSION DATE

CITY OF BOSTON, MASSACHUSETTS

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NARRATIVE STATEMENT OF BUDGET ESTIMATES

CODE NO. - 142

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This statement sets forth an explanation of the estimated costs shown under the Project Budget, Code No. - 141.

| | | | Estimated Costs |
|---|---|---|---|
| A. | Capital Costs | | N.A. |
| B. | Operating and Maintenance Costs | | N.A. |
| C. | Study and Evaluation Costs | | |
| | 1. | Direct Staff Salaries (see Schedule 1) | $107,700 |
| | 2. | Fringe Benefits - 13% of direct staff salaries (10% for retirement and 3% for Blue Cross - Blue Shield) | 14,000 |
| | 3. | Consultants (see Schedule 2) | 105,000 |
| | 4. | Direct General Overhead - rental of office space and equipment, pro rata amount for central staff activities, office supplies, printing, maps, blueprints, misc. | 107,700 |
| | 5. | Travel (see Schedule 3) | 3,900 |
| | 6. | Reports | 2,500 |
| | 7. | Sub-total | 340,800 |
| | 8. | Contingencies - 10% | 34,080 |
| | 9. | Total - Study and Evaluation | 374,880 |
| Total (Lines A-C) | | | say 375,000 |
| D. | Federal Grant - $\frac{2}{3}$ | | $250,000 |
| E. | Local Share - $\frac{1}{3}$ | | 125,000 |

## SCHEDULE # 1 - DIRECT STAFF SALARIES

| | Annual Salary Level | % Charged to TSG | Annual Salary Charged to TSG | Total Costs 24 months |
|---|---|---|---|---|
| CADS Coordinator | $14,000 | 50% | $7,000 | $14,000 |
| Chief Trans. Planner | 13,000 | 50% | 6,500 | 13,000 |
| Urban Designer | 13,000 | 5% | 650 | 1,300 |
| Architect | 12,000 | 10% | 1,200 | 2,400 |
| Chief Planner | 13,000 | 5% | 650 | 1,300 |
| Development Spec. | 13,000 | 30% | 3,900 | 7,800 |
| Lawyer | 13,000 | 15% | 1,950 | 3,900 |
| Community Liaison Officer | 13,000 | 50% | 6,500 | 13,000 |
| 4 Planning Aides @ 7,000 | 28,000 | 50% | 14,000 | 28,000 |
| 3 Secretaries @ 6,000 | 18,000 | 50% | 9,000 | 18,000 |
| 1 Clerical Assistant | 5,000 | 50% | 2,500 | 5,000 |
| Total | | | | $107,700 |

## Schedule 2 - Consultants

| | TSG - 24 months |
|---|---|
| Graphics Consultant | $25,000 |
| Engineering Consultant | 45,000 |
| Transportation Consultant | 35,000 |
| | $105,000 |

## Schedule 3 - Travel

| | | |
|---|---|---|
| a. 4 Annual Trips to Washington, D.C. @ $100 | | $ 800 |
| b. 5 Annual Trips to Other Cities @ $200 | | 2,000 |
| c. Mileage, cab fare, etc. @ $10/week | | 1,040 |
| | | $ 3,840 |
| | say | $ 3,900 |

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SOURCE OF LOCAL FUNDS

CODE NO. - 143

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The local share of the study and evaluation costs under the Technical Studies Grant will be provided generally by the City of Boston and the Boston Redevelopment Authority in the form of cash and services. Cash is provided under the annual budget of the City of Boston.

If the urban renewal projects in the Central Business District are approved, then certain expenses associated with the moving sidewalk may be included as eligible project expenses.

APPLICATION FOR
TECHNICAL STUDIES GRANT

SUBMISSION DATE

CITY OF BOSTON, MASSACHUSETTS

LABOR STANDARDS DATA

CODE NO. - 151

The City of Boston hereby requests the Department of Transportation for a determination of prevailing wage rates.

APPLICATION FOR
TECHNICAL STUDIES GRANT

CITY OF BOSTON, MASSACHUSETTS SUBMISSION DATE:

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RESOLUTION OF THE BOSTON
REDEVELOPMENT AUTHORITY CODE NO. 161

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WHEREAS under the Urban Mass Transportation Act of 1964, as amended, the Department of Transportation may make grants to local public bodies to assist them in preparing technical studies in connection with the development of improved mass transportation facilities and techniques;

WHEREAS the Boston Redevelopment Authority desires to undertake the preparation of technical studies in connection with the development of improved mass transportation facilities and techniques;

WHEREAS Title VI of the Civil Rights Act of 1964 and the regulations of the Department of Transportation effectuating that Title prohibit discrimination on the basis of race, color, or national origin in the use of all facilities and improvements provided by Federal assistance;

WHEREAS the Authority is cognizant of the conditions that are imposed in the undertaking and carrying out of programs assisted under Section 9 of the Urban Mass Transportation Act of 1964, as amended, including those relating to labor standards and equal employment opportunity; and

WHEREAS it is estimated that the cost of the activities proposed to be carried out in the preparation of technical studies exceeds the usual expenditures of the Authority for comparable activities by two hundred and fifty thousand dollars ($250,000.).

NOW, THEREFORE, BE IT RESOLVED BY THE BOSTON REDEVELOPMENT AUTHORITY:

1. That the Director is hereby authorized, on behalf of the Authority, to execute and file an application with the Department of Transportation for a Technical Studies Grant under Section 9 of the Urban Mass Transportation Act of 1964, as amended, for the planning, engineering and designing of an urban mass transportation project consisting of a moving sidewalk to be located in the City of Boston, such activities to include studies relating to management operations, capital requirements and economic feasibility, preparation of engineering and architectural surveys, plans and specifications, and other similar or related activities in preparation for the construction of such a moving sidewalk, and the evaluation of the moving sidewalk after installation.

2. That the United States of America and the Secretary of the Department of Transportation be, and they hereby are, assured of full compliance by the Authority with regulations of the Department of Transportation effectuating Title VI of the Civil Rights Act of 1964.

3. That the United States of America and the Secretary of the Department of Transportation be, and they hereby are, assured of full compliance by the Authority with the Federal labor standards imposed under the Urban Mass Transportation Act of 1964, as amended.

4. That such Federal funds as may be granted under the provisions of Section 9 of the Urban Mass Transportation Act of 1964, as amended, may be expended for the purposes for which granted.

5. That an amount not to exceed one hundred and twenty five thousand dollars ($125,000.) may be expended as the local share required to be contributed under said statute; such expenditure to be made from the general planning budget of the Authority.

# CERTIFICATE OF VOTE

The undersigned hereby certifies as follows:

(1) That he is the duly qualified and Acting Secretary of the Boston Redevelopment Authority, hereinafter called the Authority, and the keeper of the records, including the journal of proceedings of the Authority.

(2) That the following is a true and correct copy of a vote as finally adopted at a meeting of the Authority held on ______________________________ and duly recorded in this office:

(3) That said meeting was duly convened and held in all respects in accordance with law, and to the extent required by law, due and proper notice of such meeting was given; that a legal quorum was present throughout the meeting, and a legally sufficient number of members of the Authority voted in a proper manner and all other requirements and proceedings under law incident to the proper adoption or the passage of said vote have been duly fulfilled, carried out and otherwise observed.

(4) That the ______________________________________________ to which this certificate is attached is in substantially the form as that presented to said meeting.

(5) That if an impression of the seal has been affixed below, it constitutes the official seal of the Boston Redevelopment Authority and this certificate is hereby executed under such official seal.

(6) That ________________ is the ________________ of this Authority.

(7) That the undersigned is duly authorized to execute this certificate.

IN WITNESS WHEREOF the undersigned has hereunto set his hand this ______ day of ________________ 196__.

BOSTON REDEVELOPMENT AUTHORITY

LS

By ______________________________
Secretary

APPLICATION FOR
TECHNICAL STUDIES GRANT

CITY OF BOSTON, MASSACHUSETTS SUBMISSION DATE:

OPINION AND CERTIFICATE OF COUNSEL CODE NO. 163

I have examined the application of a technical studies grant to undertake preliminary planning and engineering for a proposal to construct a moving sidewalk in the Central Business District under the Urban Mass Transportation Act of 1964, as amended, and my opinion relating to this application is as follows:

1. The Boston Redevelopment Authority is a body politic and corporate organized under Chapter 121 of the Massachusetts General Laws, as amended.

2. The Authority has the following powers that enable it to make application to the United States Government for a technical studies grant and to expend the monies received under such grant:

(a) under Sections 26P and 26 AAA of Chapter 121 the power to prepare community renewal programs, general neighborhood plans and urban renewal plans;

(b) under Sections 26P and 26AAA of Chapter 121 the power to make studies including distribution studies in connection with the preparation of such programs and plans;

(c) under Sections 26J, 26P, 26YY, and 26AAA of Chapter 121 the power to design street improvements pursuant to an approved urban renewal plan;

(d) under Chapter 652 of the Acts of 1960 the power, as the planning board of the City, to prepare studies and plans for improving the distribution system of the City; and

(3) under Section 26EE of Chapter 121 the power to contract with any department of the City for the latter to carry out powers and duties of the City including those powers relating to street improvements.

3. The Authority has the power to contract for and receive a federal grant under Sections 26P and 26AAA of Chapter 121 and a local grant under Sections 26Q, 26AAA, and 26BBB of Chapter 121.

4. I further certify that there is no pending or threatening litigation which might in any way adversely affect the proposed project.

5. Therefore, it is my opinion that the Boston Redevelopment Authority has the necessary legal authorization to apply for,

receive and expend funds received from the United States Government under the Urban Mass Transportation Act of 1964, as amended, for the purposes as stated in the application.

John C. Conley
General Counsel

T10
BRA1 Boston Redevelopment Auth.

The Lab Is a City.

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